# CHAPTER 4
# Water Quality Compliance (SWRP Guidelines Section V)

**SWRP Checklist Guidelines**

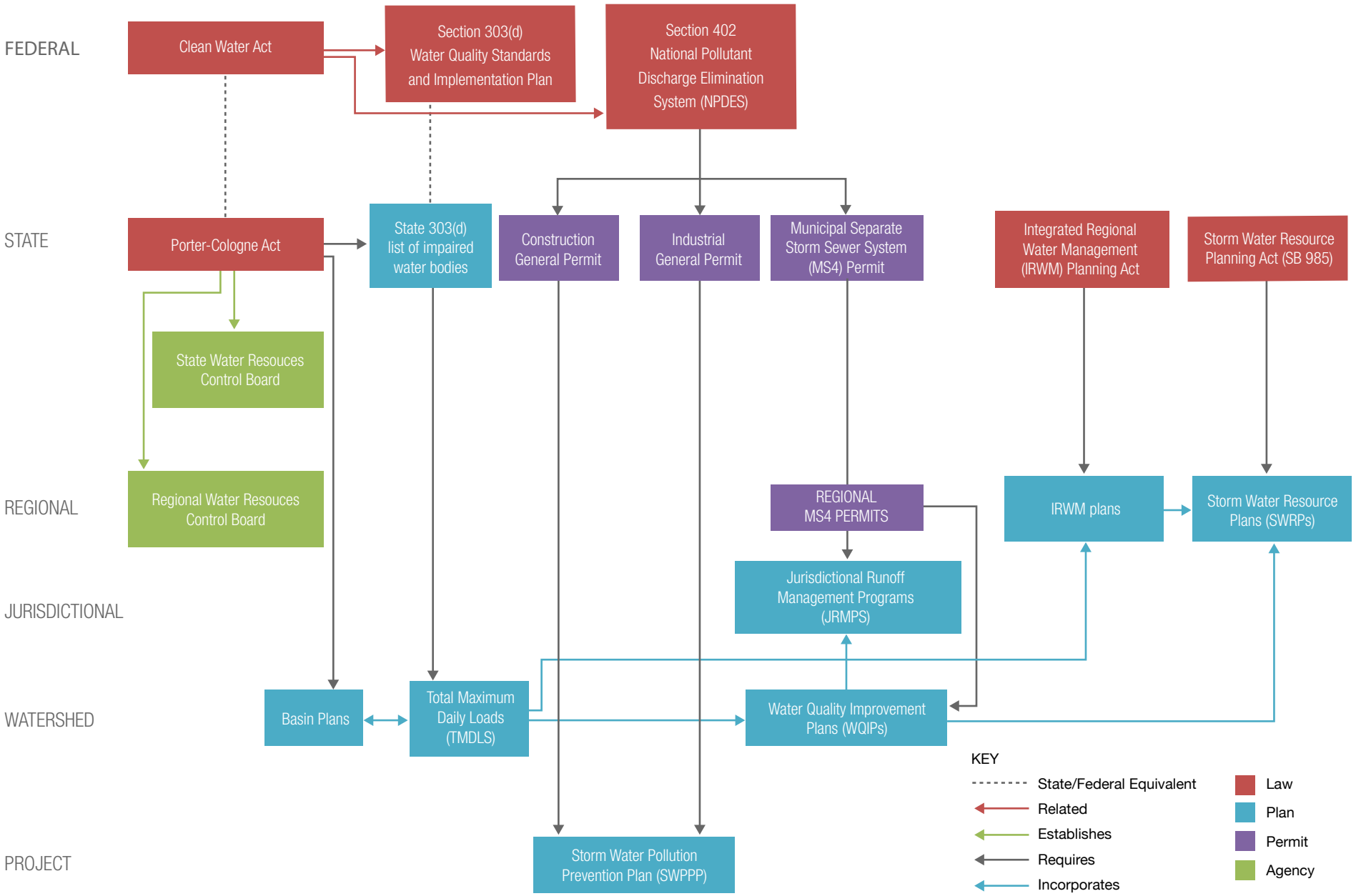
- ☒ Plan identifies activities that generate or contribute to the pollution of storm water or dry weather runoff, or that impair the effective beneficial use of storm water or dry weather runoff.
- ☒ Plan describes how it is consistent with and assists in, compliance with total maximum daily load implementation plans and applicable national pollutant discharge elimination system permits.
- ☒ Plan identifies applicable permits and describes how it meets all applicable waste discharge permit requirements.

This chapter discusses the compliance of the SWRP with other water quality regulations for the County of San Diego. Regulatory authorities exist on the federal, state, and regional levels for the protection of water quality in California. With regard to water quality management responsibilities, the USEPA is the federal agency pursuant to the Clean Water Act, and the SWRCB is the state agency pursuant to the Porter-Cologne Act. The SDRWQCB implements water quality regulations throughout the San Diego Region, including the County of San Diego areas.

Figure 4-1 provides a flow chart of California water quality legislation, the associated permits reflecting this legislation, and required plans for compliance with these permits. Background on these permits and plans is described in Section 4.1 of this chapter. Section 4.2 summarizes the different activities within San Diego County that generate or contribute to the pollution of storm water or dry weather runoff organized by WMA.

## 4.1 Applicable Permits and Plans

The purpose of the Clean Water Act is to protect and maintain the quality and integrity of the nation's waters by requiring states to develop and implement state water plans and policies. California implemented the Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) in 1969. The Porter-Cologne Act established the SWRCB and divided California into nine regions, each overseen by a RWQCB, such as the SDRWQCB. The Clean Water Act and the Porter-Cologne Act established several permits and plans, including the Water Quality Control Plans (basin plans) and the NPDES, as discussed below.




SOURCE: ESA

SWRP . 160618

**Figure 4-1**
California Water Quality Legislation

### 4.1.1 Basin Plans and Impaired Water Bodies

The nine RWQCBs within the state are responsible for adoption and implementation of basin plans, issuance of waste discharge requirements, and performing other functions concerning water quality control within their respective regions, subject to SWRCB review or approval (SDRWQCB, 2012). According to California Water Code Section 13050, basin plans establish the beneficial uses to be protected for the waters within a specified area, water quality objectives to protect those uses, and an implementation program for achieving the objectives. This SWRP incorporates the water quality objectives listed in the SDRWQCB Basin Plan.

Under Section 303(d) of the Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters. Impaired waters are waters that do not meet water quality standards identified in the basin plan for that region, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish a priority ranking for listed waters and develop TMDL action plans to improve water quality. TMDLs are described in Section 4.1.2 below.

### 4.1.2 Total Maximum Daily Loads

The Clean Water Act Section 303(d) requires states to identify waters that do not meet certain water quality standards and develop TMDLs for them. Additionally, TMDLs are programs for implementation of existing water quality standards and are established in the Regional Basin Plan subject to the requirements of the California Water Code Section 13242.

A TMDL is a quantitative assessment of water quality problems, contributing sources, and load reductions or control actions needed to restore and protect bodies of water. The TMDL approach provides a framework for evaluating pollution control efforts and for coordination between federal, state, and local efforts to meet water quality standards. TMDLs are adopted as amendments to the region's basin plan (SDRWQCB, 2016a).

A TMDL project may consist of a single water body and pollutant or a combination of multiple water bodies and pollutant listings to restore impaired water bodies (SDRWQCB, 2016b). SDRWQCB works collaboratively with stakeholder groups to address its impaired water bodies and define TMDLs. The development steps include assessing the water body, defining total loads, developing allocations, and implementation plans to address the water quality impairment(s) (SDRWCB, 2016c).

Table 4-1 below lists the TMDLs that have been adopted within the San Diego Region, along with their adoption date.

**TABLE 4-1**
**TMDLS ADOPTED BY SDRWQCB FOR THE SAN DIEGO REGION**

| Adopted TMDLs | Adoption Date |
|---|---|
| Chollas Creek Diazinon TMDL | August 14, 2002 |
| Rainbow Creek Nitrogen and Phosphorus TMDLs | February 9, 2005 |
| Shelter Island Yacht Basin Dissolved Copper TMDL | February 9, 2005 |
| Chollas Creek Copper, Lead and Zinc TMDLs | June 13, 2007 |
| Indicator Bacteria: Revised Project I – Twenty Beaches and Creeks in San Diego Region (including Tecolote Creek) | February 10, 2010 |
| Indicator Bacteria: Project II – Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay | June 11, 2008 |
| Los Peñasquitos Lagoon Sediment TMDL | June 13, 2012 |
| **Adopted Alternative Approach TMDL** | **Adoption Date** |
| Loma Alta Slough TMDL Phosphorus | June 26, 2014 |

SOURCE: SDRWQCB, 2016b

There are many TMDL projects that are currently under development. Table 4-2 below lists the TMDLs that are in the process of being developed for the San Diego Region.

**TABLE 4-2**
**TMDLS IN PROGRESS FOR THE SAN DIEGO REGION**

| Proposed TMDLs |
|---|
| San Diego Bay Marine Sediments TMDLs:<br>• Mouth of Chollas Creek<br>• Seventh Street Channel (Paleta Creek)<br>• Switzer Creek<br>• B Street/Broadway Piers<br>• Downtown Anchorage<br>• Naval Station Submarine Base |
| TMDLs for Impaired Lagoons, Adjacent Beaches, and Agua Hedionda Creek |
| Tijuana River and Estuary |
| Famosa Slough |
| Santa Margarita River Estuary |

SOURCE: SDRWQCB, 2016c.

This SWRP incorporates the TMDLs for the San Diego Region.

## 4.1.3 National Pollutant Discharge Elimination System Permits

In 1972, the Clean Water Act was amended to state that discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a NPDES permit (SWRCB, 2013). General permits establish essential regulatory requirements for a broad range of activities. NPDES permits that apply to the San Diego Region include the Construction General Permit, the Industrial General Permit, and the MS4 Permit. These permits are described in more detail below.

### 4.1.3.1 Construction General Permit

Construction projects (or projects that are part of a larger development plan) that disturb one or more acres of ground surface must obtain coverage under the Construction General Permit (2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ). Compliance with the Construction General Permit requires the preparation and implementation of a project-specific Storm Water Pollution Prevention Plan (SWPPP). The SWPPP describes which BMPs will be implemented on site, where they will be located to prevent pollutants from contacting storm water, and how they will impede polluted runoff from moving off site into receiving waters. Categories of BMPs include erosion control, sediment control, waste management, good housekeeping, and post-construction. The SWPPP must also detail any pertinent monitoring and sampling requirements to be performed throughout the construction period, which are identified in the Construction General Permit and are dependent on the sediment and receiving water risk level of the site. Compliance with the Construction General Permit is implemented and enforced by SWRCB, which runs the Storm Water Multiple Application and Report Tracking System website, where storm water permit documents are electronically filed. SWRCB also processes all Notice of Intent documents prepared by projects intending to comply with the Construction General Permit (SDRWQCB, 2016d). Projects evaluated and prioritized by this SWRP disturbing more than an acre of ground surface would be required to comply with the Construction General Permit requirements.

### 4.1.3.2 Industrial General Permit

SWRCB adopted the most recent version of the Industrial General Permit in July 2015 (Order 2014-0057-DWQ). The purpose of this permit is to protect water quality during industrial operations. A SWPPP must be prepared that includes BMPs to be implemented throughout the site operation. BMPs must include all minimum BMPs identified in the Industrial General Permit that are required for all facilities, along with any applicable advanced BMPs. The SWPPP also requires monitoring. Minimum BMP types include good housekeeping, preventative maintenance, spill and leak prevention and response, material handling and waste management, erosion and sediment control, quality assurance, and record keeping. Operation of industrial facilities must comply with discharge prohibitions, effluent limitations, receiving water limitations, and TMDLs for receiving waters. Monitoring and receiving water sampling requirements for the facility must also be detailed in the SWPPP. The Industrial General Permit requires each facility to have a Pollution Prevention Team established and responsible for assisting with the implementation of the requirements in the Permit (SWRCB, 2014).

Projects evaluated and prioritized by this SWRP would be required to comply with the Industrial General Permit if they involve industrial operations as identified by the permit, although this is not expected for the types of projects that are typically used to address storm water.

#### 4.1.3.3 San Diego Municipal Separate Storm Sewer System (MS4) Permit

The San Diego Region's MS4 Permit (Order No. R9-2013-001, as amended by Order Nos R9 2015-001 and R9 2015-011) is designed to regulate discharges from municipal separate storm sewer systems. The MS4 Permit covers 39 municipal, county government, and special district entities (referred to jointly as Copermittees) located in San Diego County, southern Orange County, and southwestern Riverside County who own and operate large MS4s, which discharge storm water (wet weather) runoff and non-storm water (dry weather) runoff to surface waters (SDRWQCB, 2015).

The MS4 Permit includes minimum BMPs required for commercial, industrial, municipal, and residential operations. The Permit also requires inspection of BMPs. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4 (SDRWQCB, 2015). The San Diego Low Impact Development Design Manual details various LID BMPs and provides guidance on how to select them (CSD, 2011a).

The MS4 Permit requires the preparation of WQIPs for each WMA. The goal of the WQIPs is to guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. WQIPs must identify the highest priority water quality conditions and sources of pollutants or stressors. To identify the water quality priorities within each watershed addressed by their WQIP, the responsible agencies within each WMA considered various factors. These factors included but are not limited to: receiving waters listed as impaired on the Clean Water Act Section 303(d) List, TMDLs adopted and under development by the SDRWQCB, sensitive or highly valued receiving waters, and monitoring data. Following identification of highest priority water quality conditions, water quality improvement goals and strategies must be developed to address these conditions (SDRWQCB, 2015).

The MS4 Permit requires implementation of the Jurisdictional Runoff Management Programs (JRMPs) in accordance with the strategies identified in the WQIPs. The goal of JRMPs is to effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the maximum extent possible (SDRWQCB, 2015). A list of entities within the San Diego Region that have developed JRMPs and the corresponding watersheds is provided in Table 4-3 below.

**TABLE 4-3**
**JRMPS WITHIN THE SAN DIEGO REGION**

| Jurisdiction | Watershed |
|---|---|
| City of Carlsbad | Carlsbad |
| City of Chula Vista | San Diego Bay |
| City of Coronado | San Diego Bay |
| City of Del Mar | San Dieguito River, Los Peñasquitos |
| City of El Cajon | San Diego River |
| City of Encinitas | Carlsbad |
| City of Escondido | Carlsbad, San Dieguito River |
| City of Imperial Beach | San Diego Bay, Tijuana River |
| City of La Mesa | San Diego Bay |
| City of Lemon Grove | San Diego Bay |
| City of National City | San Diego Bay |
| City of Oceanside | San Luis Rey River, Carlsbad |
| City of Poway | San Dieguito River; Los Peñasquitos |
| City of San Diego | San Dieguito River; Los Peñasquitos; Mission Bay; San Diego River; San Diego Bay; Tijuana River |
| City of San Marcos | Carlsbad |
| City of Santee | San Diego River |
| City of Solana Beach | Carlsbad; San Dieguito River |
| City of Vista | San Luis Rey River; Carlsbad |
| County of San Diego | All |
| San Diego County Regional Airport Authority | San Diego Bay |
| San Diego Unified Port District | San Diego Bay |

SOURCE: PCW, 2016

## 4.2 Pollutant-Generating Activities

Per MS4 Permit requirements, the WQIP prepared for each WMA within the San Diego Region identifies facilities, areas, and activities responsible for generating the highest priority water conditions within that WMA. The WQIPs also recognize and identify principal pollutant sources outside of the responsible agencies' jurisdictions that are sources for pollutants in the WMAs. These include:

- Other permitted discharges
- Other potential point sources[1]
- Other nonpoint sources[2]

1 Point sources are discrete conveyances, such as pipes or ditches.

2 Nonpoint sources typically flow over land and discharge to receiving waters over a broad area, as opposed to a point location.

- Phase II MS4[3] outfalls

Other permitted discharges include those permitted under the Industrial General Permit (Section 4.1.3.2) and Construction General Permit (Section 4.1.3.1). The following sections identify the highest priority water quality conditions and the pollutant-generating facilities, areas, and facilities for each of the nine WMAs in the San Diego Region. The information in each of these sections was adapted from each WMA's respective WQIP.

### 4.2.1 Santa Margarita River

Although the Santa Margarita River WMA WQIP is still in development, pollutant-generating activities for the WMA are available through other documents. Several of the water bodies in the WMA are impaired by eutrophication, nitrogen, and phosphorus, likely from nutrient applications from agriculture, nursery operations, municipal wastewater discharges, urban runoff, and septic systems. In addition to nutrient-related concerns, other water quality concerns within the watershed include excessive sedimentation, groundwater degradation and contamination, habitat loss, channelization, flooding, and scour (erosion).

### 4.2.2 San Luis Rey River

The San Luis Rey River WMA WQIP (LWA, 2016a) identified bacteria as the highest priority water quality condition for storm water or dry weather runoff for the San Luis Rey River watershed. Other general potential pollutant sources for the San Luis Rey River watershed include 1) parks, recreational, and open space areas, 2) landfills and other treatment facilities for municipal waste, and 3) tribal lands, federal lands, state parks, and lands regulated by State Board Phase II permits. It should be noted that there is very limited data available to identify potential pollutants in the watershed due to the monitoring locations. These monitoring locations do not represent a single land use type and thus, cannot be used to distinguish pollutant sources (LWA, 2016a).

The number of potential pollutant-generating facilities, areas, and activities within each jurisdiction of the San Luis Rey River watershed is shown in Table 4-4 below.

[3] Phase II MS4s are smaller agencies (relative to municipalities) or areas that are regulated under the State's Phase II MS4 General Permit (State Board Order No. 2013-0001-DWQ) (SDRWQCB, 2013). They are outside the authority of the responsible agencies and, within the San Diego region can include, but are not limited to, correctional, transit, educational, and federal facilities. Phase II MS4 permittees are responsible only for the runoff from their facilities and activities, whereas the responsible agencies are responsible for receiving runoff from other sources.

**TABLE 4-4**
**POTENTIAL POLLUTANT-GENERATING FACILITIES IN WATERSHED**

| Land Use | City of Vista | City of Oceanside | County of San Diego |
|---|---|---|---|
| Commercial Sites | 537 | 1,085 | 340 |
| Industrial Sites | 181 | 59 | 8 |
| Construction Sites | 29 | 0 | 1,406 |
| Parks/Recreation | 1,250 acres | 20 parks, 3 marinas | 9 parks |
| Landfill Site | None | 1 inactive site | 2 inactive sites |

SOURCE: LWA, 2016a (Table 2-16)

#### 4.2.2.1 Bacteria

Bacteria are a primary source of pollutants in the storm drain system of the San Luis Rey River watershed. Potential pollutant sources for bacteria are listed in Table 4-5 below.

**TABLE 4-5**
**POTENTIAL POLLUTANT BACTERIA SOURCES**

| General Source Categories | Targeted Source Categories |
|---|---|
| • Construction<br>• Commercial<br>• Industrial<br>• Municipal Parks and Recreation Areas<br>• Municipal Burn Sites and Landfills<br>• Residential | • Food Establishments<br>• Commercial Animal Facilities<br>• Nurseries<br>• Residential Land Uses<br>• Agricultural Land Uses<br>• Human Sources (sewer infrastructure, on-site wastewater treatment systems, homeless encampments) |

SOURCE: LWA, 2016a (Table 2-18)

The highest rated potential sources of human-related bacteria for dry and wet weather include: sanitary sewer overflows, leaking sewer pipes, homeless populations, and leaking septic systems. Sanitary sewer overflows typically occur during dry weather and are usually episodic events. During these events, leaking sewer pipes and aging infrastructure can allow water to flow outside of the intended conveyance and increase potential for cross-contamination if located near storm drains or receiving waters. Similarly, failing septic systems typically contribute to bacteria loads to the MS4 and receiving waters, and can occur during dry weather.

### 4.2.3 Carlsbad

The Carlsbad WMA WQIP (MOE, 2016) identified pesticides, bacteria, sedimentation, riparian habitat degradation, and hydromodification impacts as the highest priority conditions for storm water and dry weather runoff in the Carlsbad WMA. Specifically, riparian habitat degradation is the highest priority water quality condition for the Agua Hedionda and Escondido hydrologic area. The six HAs in the Carlsbad WMA have distinct pollutant sources. Table 4-6 below shows the number of pollutant-generating facilities and sites within each HA.

**TABLE 4-6**
**MS4 POLLUTANT GENERATING SOURCES PER HA[a]**

| Pollutant Generating Sources | Loma Alta HA | Buena Vista Creek HA | Encinas HA | San Marcos HA |
|---|---|---|---|---|
| Aggregates/Mining | 0 | 1 | 0 | 1 |
| Agriculture | 0 | 1 | 4 | 0 |
| Animal Facilities | 10 | 5 | 5 | 45 |
| Auto Repair, Fueling, or Cleaning | 92 | 131 | 67 | 136 |
| Auto Parking Lots or Storage | 6 | 16 | 27 | 4 |
| Auto Body Repair or Painting | 28 | 19 | 12 | 48 |
| Nurseries/Greenhouses | 4 | 28 | 59 | 96 |
| Building Materials Retail | 2 | 0 | 2 | 30 |
| Chemical and Allied Products | 4 | 0 | 4 | 4 |
| Concrete Manufacturing | 6 | 1 | 0 | 4 |
| Eating or Drinking Establishments | 123 | 391 | 162 | 501 |
| Equipment Repair or Fueling | 14 | 8 | 40 | 87 |
| Fabricated Metal | 17 | 6 | 42 | 39 |
| Food Manufacturing | 8 | 3 | 21 | 30 |
| General Contractors | 54 | 26 | 51 | 129 |
| General Industrial | 62 | 10 | 98 | 76 |
| General Retail | 125 | 94 | 58 | 65 |
| Health Services | 0 | 2 | 0 | 1 |
| Institutional | 6 | 2 | 0 | 0 |
| Mobile Landscaping | 0 | 0 | 0 | 0 |
| Motor Freight | 12 | 3 | 10 | 23 |
| Offices | 70 | 36 | 0 | 2 |
| Parks and Rec (including Golf, Cemetery) | 1 | 3 | 4 | 9 |
| Pest Control Services | 6 | 1 | 4 | 1 |
| Pool and Fountain Cleaning | 2 | 1 | 0 | 5 |
| Publicly owned treatment works | 0 | 0 | 1 | 3 |
| Primary Metal | 8 | 0 | 5 | 1 |
| Recycling & Junk Yards | 0 | 2 | 6 | 4 |
| Roads, Streets & Parking, Freeways, Railways | 0 | 0 | 0 | 1 |
| Stone/Glass Manufacturing | 8 | 3 | 10 | 10 |
| Storage/Warehousing | 14 | 9 | 48 | 108 |
| Municipal | 34 | 81 | 69 | 119 |
| Residential (acres) | 2,025 | 7,345 | 6,613 | 12,977 |

a. The quantities in this table represent current data at the time of the WQIP's publication. These quantities are subject to change given the high turnover of facilities in the hydrologic area.

SOURCE: MOE, 2016 (Tables 23, 28, 35 and 39)

### 4.2.4 San Dieguito River

The San Dieguito River WMA WQIP (AMEC, 2015a) identified bacteria as the highest priority condition for storm water and dry weather runoff in the San Dieguito River WMA. According to the WQIP, the highest priority MS4 sources potentially contributing bacteria are residential areas and sanitary sewer overflows/septic systems. The likely sources for causing bacteria impairments are shown in Table 4-7 below. Sources of bacteria according to land uses are summarized in Table 4-8.

**TABLE 4-7**
**LIKELY SOURCES OF BACTERIA IN SAN DIEGUITO RIVER WMA[a]**

| Source | Land Use Category | Number of Identified Likely Sources |
|---|---|---|
| Agriculture | Other | 2 facilities |
| Animal Facilities | Commercial | 49 facilities |
| Eating or Drinking Establishments | Commercial | 420 facilities |
| Mobile Landscaping | Commercial | 3 facilities |
| Nurseries and Greenhouses | Commercial | 34 facilities |
| Roads, Streets and Parking | Municipal | 2 facilities |
| Residential Areas | Residential | 38,988 acres |

a. The quantities in this table represent current data at the time of the WQIP's publication. These quantities are subject to change given the high turnover of facilities in the water management area.

SOURCE: AMEC, 2015a (Table 3-1)

Other potential sources have been identified that may contribute to the bacteria impairment within the San Dieguito River WMA but are outside of the jurisdiction of the Responsible Parties. These sources are transferred to receiving waters by the Responsible Agencies' MS4s, and include: Phase II MS4 outfalls (Del Mar Fairgrounds and North County Transit District), other permitted discharges, other potential point sources, and other nonpoint sources.

**TABLE 4-8**
**SOURCES OF BACTERIA IN THE SAN DIEGUITO RIVER WMA**

| Known or Suspected Source | Land Uses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Construction | Commercial | Industrial | Municipal | Residential | Parks and Recreational Areas | Open Space | Landfills | Other |
| By Facility | | | | | | | | | |
| Nurseries and Greenhouses | | ✓ | | ✓ | | ✓ | | | ✓ |
| Eating and Drinking Establishments | | ✓ | | ✓ | | ✓ | | | ✓ |
| Animal Facilities | | ✓ | | ✓ | | | | | ✓ |
| By Area | | | | | | | | | |
| Agriculture | | | | ✓ | ✓ | | | | ✓ |
| Roads, Streets, Parking Areas | | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| Residential Areas | | | | | ✓ | | | | ✓ |
| By Activity | | | | | | | | | |
| Mobile Landscaping | | ✓ | | ✓ | ✓ | ✓ | | | |
| Other | | | | | | | | | |
| Bacteria Regrowth and Biofilms | | | | ✓ | | | | | ✓ |
| Transient Encampments | | | | | | | | | ✓ |
| Sanitary Sewer Overflows and Septic Systems | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Wildlife | | | | ✓ | | ✓ | ✓ | ✓ | ✓ |

SOURCE: AMEC, 2015a (Table 3-3)

## 4.2.5 Los Peñasquitos

The Los Peñasquitos WMA WQIP (AMEC, 2015b) identified freshwater discharge, hydromodification, sediment, and bacteria as the highest priority conditions for storm water and dry weather runoff in the Los Peñasquitos WMA.

### 4.2.5.1 Freshwater

Freshwater discharge has a more significant impact during dry weather than wet weather since historically the creeks in the Los Peñasquitos WMA did not run at all during dry weather. Table 4-9 summarizes the sources of freshwater discharge in the Los Peñasquitos WMA.

**TABLE 4-9**
**SOURCES OF FRESHWATER DISCHARGE IN THE LOS PEÑASQUITOS WMA**

| Known or Suspected Source | Land Uses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Construction | Commercial | Industrial | Municipal | Residential | Parks and Recreational Areas | Open Space | Landfills | Other |
| Outfalls with Persistent Dry Weather Flow | | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| Irrigation Runoff | | | | ✓ | | ✓ | | | |
| Parks and Recreation (including golf courses and cemeteries) | | | | ✓ | | ✓ | | | ✓ |
| Roads, Streets, Highways, and Parking | | ✓ | | ✓ | ✓ | | | | ✓ |
| Residential Areas | | | | | | | | | |
| Sanitary Sewer Overflow | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |

SOURCE: AMEC, 2015b (Table 3-3)

### 4.2.5.2 Hydromodification

The sediment TMDL states that hydromodification has a more significant impact during wet weather than dry weather. With the increase of impervious surfaces in the watershed, less storm water can infiltrate into the ground, and more is instead directed to natural waterways or the MS4s. This means that the peak (and total) flow in the creeks is greater and occurs more rapidly than under undeveloped conditions (with fewer impervious surfaces). Table 4-10 summarizes the sources of hydromodification in the Los Peñasquitos WMA.

**TABLE 4-10**
**SOURCES OF HYDROMODIFICATION IN THE LOS PEÑASQUITOS WMA**

| Known or Suspected Source | Land Uses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Construction | Commercial | Industrial | Municipal | Residential | Parks and Recreational Areas | Open Space | Landfills | Other |
| Land Development | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| Impervious Surfaces | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| Outfalls Discharging to Canyons/Bluffs | | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| Open Space Areas | | | | | | | ✓ | | ✓ |
| Flood Control Basins | | | | ✓ | | | | | |
| Channel Drop Structures | | | | ✓ | | | | | |

SOURCE:AMEC, 2015b (Table 3-3)

### 4.2.5.3 Sediment

The sediment TMDL states that sources of sediment are more significant in wet weather than in dry weather. Hydromodification can cause significant erosion in the natural drainages and canyon walls, as well as within creek beds, banks, and floodways, as the geomorphology shifts to transport the larger flow. The higher peak flows possess greater energy, which can mobilize greater amounts and sizes of sediment. Table 4-11 summarizes the sources of sediment in the Los Peñasquitos WMA.

**TABLE 4-11**
**SOURCES OF SEDIMENT IN THE LOS PEÑASQUITOS WMA**

| Known or Suspected Source | Land Uses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Construction | Commercial | Industrial | Municipal | Residential | Parks and Recreational Areas | Open Space | Landfills | Other |
| By Facility | | | | | | | | | |
| Aggregates/Mining | | | ✓ | | | | | | ✓ |
| Animal Facilities | | ✓ | | ✓ | | | | | ✓ |
| Building Materials Retail | | ✓ | | | | ✓ | | | |
| Nurseries and Greenhouses | | ✓ | ✓ | ✓ | | | | | ✓ |
| Health Services | | ✓ | | ✓ | | | | | |
| Recycling and Junk Yards | | | ✓ | ✓ | | | | ✓ | |
| Stone/Glass Manufacturing | | | ✓ | | | | | | |
| Storage/Warehousing | ✓ | ✓ | ✓ | ✓ | | | | | ✓ |
| By Area | | | | | | | | | |
| Agriculture | | | | ✓ | ✓ | | | | ✓ |
| Auto Parking Lots or Storage | ✓ | ✓ | | ✓ | ✓ | ✓ | | | ✓ |
| General Retail | | ✓ | | | | | | | |
| Municipal | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Residential Areas | | | | | ✓ | | | | |
| By Activity | | | | | | | | | |
| Concrete Manufacturing | ✓ | | ✓ | | | | | | |
| Construction | ✓ | | | | | | | | |
| General Contractors | ✓ | | | | | | | | |
| Mobile Landscaping | | ✓ | | ✓ | ✓ | | | | |
| Other | | | | | | | | | |
| Hydromodification | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Ocean Sediment Contribution | | | | | | ✓ | | | ✓ |
| Open Space Areas | | | | | | | ✓ | | |
| Roads, Streets, Highways, and Parking | | ✓ | | ✓ | ✓ | | | | ✓ |

SOURCE: AMEC, 2015b (Table 3-3)

### 4.2.5.4 Bacteria

The bacteria TMDL states that sources of bacteria may be the same in wet and dry weather, however, the transport mechanisms are different. During storm events, bacteria are discharged to the MS4 over a general area, which receives rainfall and which can be well represented by land use. During dry weather, bacteria are conveyed by illicit discharges, irrigation runoff, infiltration, and permitted discharges. Table 4-12 provides the sources of bacteria in the Los Peñasquitos WMA.

**TABLE 4-12**
**SOURCES OF BACTERIA IN THE LOS PEÑASQUITOS WMA**

| Known or Suspected Source | Land Uses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Construction | Commercial | Industrial | Municipal | Residential | Parks and Recreational Areas | Open Space | Landfills | Other |
| By Facility | | | | | | | | | |
| Animal Facilities | | ✓ | | ✓ | | | | | ✓ |
| Eating and Drinking Establishments | | ✓ | | ✓ | | ✓ | | | ✓ |
| Nurseries and Greenhouses | | ✓ | ✓ | ✓ | | ✓ | | | ✓ |
| By Area | | | | | | | | | |
| Residential Areas | | | | | | | | | |
| Agriculture | | | | | | | | | |
| By Activity | | | | | | | | | |
| Mobile Landscaping | | | | | | | | | |
| Other | | | | | | | | | |
| Bacteria Regrowth and Biofilms | | | | ✓ | | | | | ✓ |
| Transient Encampments | | | | | | | | | ✓ |
| Open Space Areas | | | | | | | ✓ | | |
| Sanitary Sewer Overflows | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Wildlife | | | | ✓ | | ✓ | ✓ | ✓ | ✓ |

SOURCE: AMEC, 2015b (Table 3-3)

### 4.2.5.5 Other Sources

Other potential sources have been identified that may contribute to the impairment within the Los Peñasquitos WMA, including Phase II MS4 outfalls (Marine Corps Air Station Miramar, North County Transit District (NCTD), and the University of California, San Diego), other permitted discharges (Table 4-13), other potential point sources, and other nonpoint sources.

**TABLE 4-13**
**STORM WATER DISCHARGE PERMITS**

| Permit Type | Number of Permits in WMA |
|---|---|
| Municipal Storm Water | 5 |
| Industrial Storm Water | 75 |
| Construction Storm Water | 46 |
| Caltrans Storm Water | 1 |
| Other Individual NPDES Discharges | 0 |
| Total | 127 |

SOURCE: AMEC, 2015b (Table 3-2)

## 4.2.6 Mission Bay

The Mission Bay WMA WQIP (AMEC, 2016) identified bacteria and sediment as the highest priority pollutants in its WMA. Table 4-14 lists the likely sources of bacteria and sediment within the Mission Bay WMA.

**TABLE 4-14**
**LIKELY SOURCES OF BACTERIA AND SEDIMENT**

| Source Type | Category | Total Number of Sources in WMA | Bacteria | Sediment |
|---|---|---|---|---|
| Agriculture | Other | 2 (80 acres) | - | ✓ |
| Animal Facilities | Commercial | 77 | ✓ | - |
| Construction | Construction | N/A | - | ✓ |
| Eating/Drinking Establishments | Commercial | 1,281 | ✓ | - |
| Golf Courses/Parks | Municipal | 14 | ✓ | ✓ |
| Home and Garden Care | Residential | 11,463 acres | ✓ | ✓ |
| Hydromodification | Construction | N/A | - | ✓ |
| Landscaping | Commercial | 32 | ✓ | ✓ |
| Land Use Alteration | Construction | N/A | - | ✓ |
| Mobile eating/Drinking Establishments | Commercial | 2 | ✓ | - |
| Mobile Landscaping | Commercial | 205 | ✓ | ✓ |
| Nurseries/Greenhouses | Commercial | 7 | - | ✓ |
| Publicly Owned Treatment Works (POTWs) | Municipal | 1 | ✓ | - |
| Waste Disposal | Municipal | 3 | ✓ | - |

Sources are quantified by facility counts or acreage. Facility counts help define the sources during dry weather and land uses help defines sources during wet weather.
N/A = not available. The number of sources is either variable, as with construction, or is not currently assessed by the jurisdiction because of the difficulty in obtaining an accurate count.
"✓" = Source applies to highest priority water quality condition. "–" = Source does not apply to highest priority water quality condition.

SOURCE: AMEC, 2016 (Table 3-1)

Other potential sources have been identified that may contribute to the impairment within the Mission Bay WMA, including Phase II MS4 outfalls (Marine Corps Air Station Miramar, NCTD, Veterans Administration San Diego Healthcare System, and the University of California, San Diego), other permitted discharges (Table 4-15), other potential point sources, and other nonpoint sources

**TABLE 4-15**
**STORM WATER DISCHARGE PERMITS**

| Permit Type | Numbers of Permits[a] |
|---|---|
| Municipal Storm Water | 2 |
| Industrial Storm Water | 6[b] |
| Construction Storm Water | 15[b] |
| Caltrans Storm Water | 1 |
| Other Individual NPDES Discharges | 4 |
| **Total** | **28** |

a. Number of permits in Tecolote and Scripps subwatersheds only.
b. Number of individual permittees filing under statewide general permit.

SOURCE: AMEC, 2016 (Table 3-2)

During wet weather, storm water runoff may carry bacteria and sediment from agricultural lands to the MS4. The bacteria TMDL identifies wildlife areas, which include open space land uses and are sometimes not under the jurisdiction of Responsible Agencies, as sources of bacteria. The wildlife areas partially account for bacteria contributions from wild animals and decaying plant sources.

During dry weather, bacteria may enter the MS4 or receiving waters through groundwater infiltration or irrigation runoff into municipal drainage channels. Also, groundwater may contribute to the bacteria in the MS4 and receiving waters. The Tecolote Creek Comprehensive Load Reduction Plan (City of San Diego and Caltrans) identifies aerial deposition (i.e., sediment blown and redeposited by wind) as both a natural source and a source influenced by human activity for sediment in the San Diego Region.

## 4.2.7 San Diego River

The San Diego River WMA WQIP (LWA, 2016b) identified bacteria as the highest priority water quality condition. Table 4-16 provides a summary of the applicable pollutant generating facilities, areas, and activities within each participating agency's boundaries.

**TABLE 4-16**
**SUMMARY OF APPLICABLE POLLUTANT GENERATING FACILITIES, AREAS, AND/OR ACTIVITIES BY JURISDICTION**

| Potential Pollutant Source Areas | County of San Diego | City of San Diego | City of Santee | City of La Mesa | City of El Cajon |
|---|---|---|---|---|---|
| Construction, Commercial, Industrial, Municipal, Residential Facilities and/or Areas | ✓ | ✓ | ✓ | ✓ | ✓ |
| Publicly Owned Parks and/or Recreational Areas | ✓ | ✓ | ✓ | | ✓ |
| Open Space Areas | ✓ | ✓ | ✓ | | ✓ |
| Municipal Landfills or Other Treatment, Storage, or Disposal Facilities for Municipal Waste | ✓ | ✓ | | | |
| Areas Not within the Copermittee's Jurisdiction | ✓ | ✓ | | | |

SOURCE: LWA, 2016b (Table 2-17)

Table 4-17 presents a summary of the number of pollutant generating land uses in the San Diego River WMA.

**TABLE 4-17**
**POLLUTANT GENERATING LAND USES**

| Land Use | County of San Diego | City of San Diego | City of Santee | City of La Mesa | City of El Cajon |
|---|---|---|---|---|---|
| Construction Sites | 288 | 247 | 14 | 28 | 12 |
| Commercial Sites | 493 | 3,703 | 540 | 342 | 700 |
| Industrial Sites | 79 | | n/a | 17 | 104 |
| Municipal Sites | 40 | 57 | 17 | 49 | 34 |
| Parks/Recreation Areas (in sites or acres) | 25 sites | 67 sites | 279 acres | -- | 78 acres |

SOURCE: LWA, 2016b (Table 3-17)

Some additional sources of pollution identified in the San Diego River WQIP that are naturally present include wildlife, kelp, natural erosion, bacterial regrowth, natural groundwater, and wildfires. Natural sources that can be anthropogenically influenced include groundwater altered by imported water supply, aerial deposition of transportation and industrial pollutants, and erosion exacerbated by hydromodification. Sources specific to bacteria were identified within the watershed including homeless populations living near receiving waters, sludge/sewage disposal sites, and portable bathroom facilities.

## 4.2.8 San Diego Bay

The San Diego Bay WMA WQIP (SDBRP, 2016) identified indicator bacteria, metals, and trash as the highest priority water quality conditions. Table 4-18 summarizes the facilities and activities identified as known or suspected sources of pollutants and stressors identified for the highest priority conditions for the San Diego Bay WMA.

**TABLE 4-18**
**LIKELY SOURCES OF POLLUTANTS AND STRESSORS**

| Source Type | Total Number of Facilities in Hydrologic Area[a] | Bacteria | Metals |
|---|---|---|---|
| Agriculture | 1 | ✓ | ✓ |
| Animal Facilities | 82 | ✓ | |
| Automotive | 876 | | ✓ |
| Eating or Drinking Establishments | 2,316 | ✓ | |
| Equipment | 91 | | ✓ |
| General Industrial | 95 | | ✓ |
| Institutional | 68 | | ✓ |
| Manufacturing | 57 | | ✓ |
| Metal | 40 | | ✓ |
| Nurseries/Greenhouses | 18 | ✓ | ✓ |
| Stone/Glass Manufacturing | 9 | | ✓ |
| Storage/Warehousing | 210 | | ✓ |
| Municipal | 298 | | ✓ |
| Residential Areas[b] | 10,716 | ✓ | ✓ |

✓ = Stressor has been identified for the Highest Priority Condition in the hydrological area.
Blank = Stressor is not identified as a potential source in the WURMP Annual Reports.
a. Total number of facilities in San Diego Mesa HA. Many of these facilities do not drain to the Chollas Creek HSA.
b. Residential areas are reported as acreage and not by the number of dwellings.

SOURCE: SDBRP, 2016 (Table 3-3)

Other potential sources have been identified that may contribute to the impairment within the San Diego Bay WMA, including Phase II MS4 outfalls (Metropolitan Correctional Center San Diego and R.J. Donovan Correctional Facility), other permitted discharges, other potential point sources, and other nonpoint sources. Table 4-19 lists discharge permits within the Pueblo HA of the San Diego Bay WMA. The Pueblo San Diego Watershed contains the most concentrated area of urban land uses and MS4 outlets and outfalls and has the highest priority water quality conditions for bacteria and metals.

The highest relative load contributions of dissolved copper, lead, and zinc have been attributed to freeways and commercial/industrial land uses, which may include both point and nonpoint sources. Brake pad wear on automobiles is a likely nonpoint source of copper, and, to a lesser extent, a source of lead and zinc in the creek. Discharge of drinking water supply has also been identified as a point source of metals, and may partially be contributed to by piping infrastructure. Sediment and groundwater flows have also been identified as nonpoint sources of these metals into the creeks.

**TABLE 4-19**
**DISCHARGE PERMITS**

| Permit Type | Number of Permits in the Pueblo Hydrologic Area |
|---|---|
| Municipal Storm Water | 1 |
| Industrial Storm Water | 93 |
| Construction Storm Water | 89 |
| Caltrans Storm Water | 1 |
| Other Discharge Permits[a] | 5 |
| **Total** | **189** |

a. Includes Order No. R9-2010-0003, R9-2011-0022, 2011-0002-DWQ, 2011-0003-DWQ, and 2011-0004-DWQ. Dischargers may apply for such permits, as necessary.

SOURCE: SDBRP, 2016 (Table 3-2)

## 4.2.9 Tijuana River

The WQIP for the Tijuana River WMA (URS, 2016) identified sedimentation and siltation in the Tijuana River and turbidity in the Tijuana River and Tijuana River Estuary as the highest priority water quality conditions in the WMA. Segments of both the Tijuana River and the Tijuana River Estuary are identified on the 303(d) list as impaired by sedimentation/siltation or the associated constituent solids, total suspended solids (TSS), and turbidity.

Sediment and turbidity were determined to originate from a range of sources including regulated and unregulated; point and nonpoint; and natural and anthropogenic sources. Anthropogenic sources of sediment occur when storm water runoff rates exceed natural levels in urbanized areas, causing increased stream bank erosion. Other priority water quality conditions that were not selected to be addressed in the Tijuana River WQIP (indicator bacteria, low dissolved oxygen, nutrients, surfactants, TDS, trash, pesticides, synthetic organics, and toxicity) are being addressed by the JRMP. In addition, by addressing sediment, these pollutants often associated with sediment load, will be addressed concurrently.

Table 4-20 lists the inventory of potential pollutant-generating facilities within the Tijuana Valley hydrologic area that may cause or contribute to sedimentation/siltation and turbidity water quality condition in Tijuana River and Tijuana River Estuary in the Lower Watershed. Table 4-21 shows a similar inventory for land uses in the Tijuana Valley hydrologic area.

**TABLE 4-20**
**POTENTIAL POLLUTANT-GENERATING FACILITIES THAT MAY CONTRIBUTE TO THE HIGHEST PRIORITY WATER QUALITY CONDITION**

| Facility Type | Total |
|---|---|
| Construction Sites | 136 |
| Commercial Facilities | 1,444 |
| Industrial Facilities | 99 |
| Municipal Facilities | 38 |
| Treatment, Storage or Disposal Facilities | 20 |

SOURCE: URS, 2016 (Table 2-12)

**TABLE 4-21**
**POTENTIAL POLLUTANT-GENERATING AREAS THAT MAY CONTRIBUTE TO THE HIGHEST PRIORITY WATER QUALITY CONDITION**

| Area Type | Total |
|---|---|
| Areas where the RAs have Oversight and Discharge Responsibility | |
| Commercial | 321 |
| Institutional | 139 |
| Low Density Residential | 1,373 |
| High Density Residential | 577 |
| Transportation[a] | 2,291 |
| Vacant and Undeveloped Land | 3,403 |
| Open Space Park or Preserve | 3,892 |
| Other Park, Open Space and Recreation | 126 |
| Areas where the RAs have Oversight Responsibility Only | |
| Industrial | 1,053 |
| Areas where the RAs do not have Oversight or Discharge Responsibility | |
| Federal Lands[b] | 3,162 |
| Caltrans | 1,057 |
| Other State Lands[c] | 952 |
| School Land | 368 |
| Agricultural | 1,109 |

a. Includes local streets and parking lots. Excludes Caltrans.
b. Includes BLM, USFWS, military, and other federal lands
c. Includes California Department of Fish and Game, State Parks, and other state lands.

SOURCE: URS, 2016 (Table 2-13)

Other potential sources have been identified that may contribute to the impairment within the Tijuana River WMA, including other permitted discharges (Table 4-22), other potential point sources, and other nonpoint sources.

**TABLE 4-22**
**NPDES PERMITTED DISCHARGES THAT MAY CONTRIBUTE TO HIGHEST PRIORITY WATER QUALITY CONDITION**

| Permit Type | Number of Permits in Tijuana River WMA |
|---|---|
| Industrial | 47 |
| Construction | 19 |
| Individual permits | 2 |

Includes NPDES permits that may be relevant to sediment: Individual NPDES permit for discharges from Naval Base Coronado, specifically, Naval Outlying Field (NOLF) and discharges from Caltrans sites.

Includes permittees in the Lower Watershed only.

SOURCE: URS, 2016 (Table 2-14)

Potential nonpoint source discharges in the Tijuana River WMA include agricultural operations, erosion related to unimproved roadways in rural areas, homeless encampments, and natural sources.

The Tijuana River main stem and tributary drainages of Yogurt Canyon, Goat Canyon, and Smuggler's Gulch transport anthropogenic-derived sediment and other pollutants generated in Mexico to receiving waters. Both point and nonpoint sources of pollutants are present in the Mexican portion of the watershed.